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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/076,888	02/15/2002	Saul S. Kato	21434-06721	3896

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EXAMINER

CAO, HUEDUNG X

ART UNIT

PAPER NUMBER

2671

DATE MAILED: 06/28/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/076,888

Applicant(s)

KATO, SAUL S.

Examiner

Huedung X Cao

Art Unit

2671

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This action is responsive to communications: application, filed on 02/15/2002.
2. Claims 1-23 are pending in the case. Claims 1, 17, 19 and 23 are independent claims.

This application was filed on 02/15/2002. No claims have been amended.

3. The present title of the application is "Multi-Resolution Geometry".

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glassner (US 5,428,717).

As per claim 1, Glassner teaches the claimed "method for creating a three-dimensional visual representation of an object having multiple resolutions" comprising the steps of:

"retrieving coordinates of vertices for the object" (Glassner, fig. 18 a-b, and col. 16, lines 3-64);

determining a collapse order for the vertices identified in the vertex list (Glassner, fig. 18 a-b, and col. 16, lines 3-64);

reordering the vertices identified in the vertex list responsive to the determined collapse order (Glassner, S430); and

creating a vertex collapse list responsive to the collapse order (Glassner, S440).

It is noted that Glassner does not explicitly teach "the vertex collapse list specifies, for a target vertex, a neighbor vertex to collapse to" as claimed. However, Glassner's replacing the

polygons of a plurality vertices with a single triangle with three vertices (step S440, figure 21) suggests the vertex collapse list specifies a neighbor vertex to collapse to as claimed. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to configure Glassner's vertex collapse list as claimed by specifying the vertices of the polygon which are collapsed into one of the vertices of the triangle as claimed.

using the vertex collapse list and a level of detail to identify at least one display vertex of the object (Glassner, S420);

rendering the display vertex to produce the three dimensional visual representation of the object which Glassner does not explicitly disclose; however, it would have been obvious to one of ordinary skill in the art at the time the invention was made by rendering the display vertex to compute the display screen pixels that represent each primitive in order to produce the three dimensional object.

Claim 2 adds into claim 1 the steps of determining a collapse list process which Glassner suggests in figures 23A-23C.

Claim 3 adds into claim 2 the steps of computing visual distortion factors which Glassner suggests in figure 23A.

Claim 4 adds into claim 3 the steps of computing an area change factor for each collapse path which Glassner suggests in step S400, figure 23A.

Claim 5 adds into claim 3 the steps of computing a volume change factor for the selected collapse path which Glassner suggests in figure 23C.

Claim 6 adds into claim 5 the steps of computing a volume which Glassner suggests in figure 23C.

Claim 7 adds into claim 2 the step of receiving an input from a user specifying a priority weight for a visual distortion factor which Glassner teaches in figure 21.

Claim 8 adds into claim 2 the steps of determining a collapse value for the selected collapse path which Glassner suggests in figures 23A.

Claim 9 adds into claim 2 the steps of determining a set of collapse paths which Glassner suggests in figure 25.

Claim 10 adds into claim 2 the steps of displaying the object before and after being collapse which Glassner suggests in figures 18-19.

Claims 11-13 add into claim 1 the steps of specifying the minimum number of vertices, the resolution levels and the attributes of the vertices which Glassner suggests in figures 8 and 16.

Claims 14-16 add into claim 2 the texture map, normal map, and color map of the vertices which Glassner suggests in column 1, lines 30-63.

Due to the similarity of claims 17-18, 19-22 and 23 to claims 1-16, they are rejected under a similar reason.

Accordingly, the claimed invention as represented in the claims does not represent a patentable distinction over the art of record.

Art Unit: 2671

Inquires

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Huedung Cao** whose telephone number is **(703) 308-5024**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Mark Zimmerman**, can be reached at **(703) 305-9798**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Huedung Cao
Patent Examiner



**MARK ZIMMERMAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600**